

AD-A131 982

THE MARINE CORPS BASIC TRAINING EXPERIENCE: STRESSES
LEADERSHIP AND GROUP... (U) NAVAL HEALTH RESEARCH CENTER
SAN DIEGO CA R R VICKERS ET AL. NOV 82

1/1

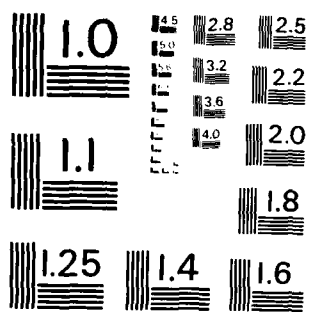
UNCLASSIFIED

NAVHLTHRSCHC-82-28

F/G 5/9

NL

END
DATE
FILMED
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

**THE MARINE CORPS BASIC TRAINING EXPERIENCE:
STRESSES, LEADERSHIP, AND GROUP COHESION
AS PREDICTORS OF ATTITUDES, HEALTH, AND
PERFORMANCE**

R. R. VICKERS, M. T. WALLICK & L. K. HERVIG

REPORT NO. 82-28

AD A 131982

DTIC FILE COPY



This document has been approved
for public release and sale; its
distribution is unlimited.

NAVAL HEALTH RESEARCH CENTER

P. O. BOX 85122
SAN DIEGO, CALIFORNIA 92138

NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND
BETHESDA, MARYLAND

88-08 29 068

DTIC
AUG 31 1983
A

THE MARINE CORPS BASIC TRAINING EXPERIENCE:
Stresses, Leadership, and Group Cohesion as Predictors of
Attitudes, Health, and Performance*

Ross R. Vickers, Jr.

Marie T. Wallick

Linda K. Hervig

Environmental Physiology Department

P.O. Box 85122

Naval Health Research Center

San Diego, CA 92138-9174

Accession For

NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	<input type="checkbox"/>

10/1/82

H

* Report No. 82-28, supported by the Naval Medical Research and Development Command, Department of the Navy, under Research Work Unit M0096.PN001-1035. The views presented are those of the authors. No endorsement by the Department of the Navy has been given or should be inferred.

SUMMARY

Background. A review of basic training practices by the House of Representatives Subcommittee on Military Personnel produced the recommendation that the Marine Corps document the effects of the stresses of basic training (BT). The Naval Health Research Center was tasked with responding to a request from the Commandant of the Marine Corps to (a) identify stresses in basic training with positive effects and (b) isolate any stresses in BT with questionable effects. This report describes the results of two studies relating questionnaire measures of BT stresses, leadership, and group cohesion to a variety of BT outcomes.

Method. The first study involved 413 recruit volunteers selected at random from 32 BT platoons; the second study involved 425 volunteers from 39 BT platoons. The day prior to graduation from BT, each participant completed a questionnaire designed to measure key BT stresses, leadership style, and group cohesion. Responses to the questionnaire provided assessments of BT experiences as perceived by recruits.

Outcomes included: (a) Attitudes toward the Marine Corps. (b) Perceived personal improvement during BT. (c) Performance in BT. (d) Health during BT. (e) Fleet Marine Force (FMF) attrition. Measures for (a) and (b) were included in the questionnaires; the remaining outcome measures were taken from Marine Corps records. Pearson product moment correlations were employed to relate BT stresses, leadership, and group cohesion to the BT outcomes.

Results. Interviews with recruits comprised the first phase of the research program. These interviews provided recruit evaluations of BT experiences which were the basis for identifying positive stresses (high levels of skill and ability requirements, high levels of effort requirements, emphasis on achieving the best possible performance, and emphasis on strict adherence to rules and regulations) and negative stresses (uncertainty about what was expected in BT, conflicting directives from different people, punishment for mistakes, being closely watched for mistakes, feeling unfairly treated, loss of personal freedom, and pressure to get things done). Using this classification, major findings were:

(a) Recruits endorsed statements describing positive stresses more strongly than statements describing negative stresses.

(b) Positive stresses were related to better attitudes toward the Marine Corps and greater feelings of self-improvement.

(c) Negative stresses had relatively few significant associations except in the case of unfair treatment. Unfair treatment was associated with less positive attitudes toward the Marine Corps.

(d) Leadership was viewed positively by the average recruit. Recruits with more positive perceptions of leadership also had better attitudes toward the Marine Corps and higher perceived self-improvement scores.

(e) Group cohesion had very little relation to attitudes toward the Marine Corps and none on perceived self-improvement.

(f) The typical recruit learned basic skills and knowledge requirements at a level well above the minimum acceptable to the Marine Corps. Performance, health, and FMF attrition were not related to BT stress, leadership, or group cohesion.

Conclusions. Any value of BT stresses resides in its relationship to attitudes toward the Marine Corps and the feelings of personal growth it may produce in recruits. When assessing this value, the fact that effective performance is achieved in spite of BT stresses must be kept in mind. The findings imply that positive attitudes occur when (a) BT demands effort to meet high performance goals while adhering to rules and regulations, (b) recruits feel they are treated fairly, and (c) high quality leadership is maintained. Marine Corps BT currently provides these conditions for the majority of recruits. The minimal effects of negative BT stresses may have come about because BT is a short initiation period rather than a long-term job, because positive stresses make negative stresses less important, or because of the high quality of BT leadership.

CONTENTS

	Page
Summary	i
Contents	iii
List of Tables	iv
Acknowledgments	v
Introduction	1
Method	2
Sample	2
Demographic Measures	2
Perceptions of Training	3
Training Outcomes	4
Analysis Procedures	6
Results and Discussion	7
Recruit Characteristics and Platoon Membership as Predictors of BT Stress, Leadership, Group Cohesion, and Attitudes	7
BT Stress Levels	9
BT Leadership and Group Cohesion	11
Attitudes and Personal Development	12
Recruit Performance	13
BT Stresses as Predictors of Attitudes toward the Marine Corps . .	15
BT Leadership and Group Cohesion as Predictors of Attitudes toward the Marine Corps	16
Predictors of Perceived Personal Development	18
BT Experiences as Predictors of BT Performance, BT Health, and FMF Success	19
Effects of Possible Modifiers of BT Stress- BT Outcome Relationships	20
Conclusions	21
References	24

APPENDICES

Appendix A: <u>Operational Definitions for Scales Measuring Perceptions of Basic Training</u>	A-1
Operational Definitions for Basic Training Stress Scales	A-2
Operational Definitions for Leadership and Group Cohesion Scales	A-4
Operational Definitions for Attitudes toward the Marine Corps and Perceived Personal Development Scales	A-6
Appendix B: <u>BT Stress-BT Outcome Modifier Analyses</u>	
Analysis Procedures and Results	E-1

TABLES

Table 1: Demographic Characteristics for the Two Recruit Samples.....	3
Table 2: Recruit Characteristics and Platoon Membership as Predictors of Basic Training Experiences.....	8
Table 3: Descriptive Statistics for Stress Scales.....	10
Table 4: Descriptive Statistics for Leadership and Group Cohesion Scales.....	12
Table 5: Descriptive Statistics for Attitudes Toward the Marine Corps and Perceived Personal Development Scales.....	13
Table 6: Descriptive Statistics for Recruit Performance Measures.....	14
Table 7: Basic Training Stress Correlates of Attitudes toward the Marine Corps.....	15
Table 8: Leadership and Group Cohesion Correlates of Attitudes toward the Marine Corps.....	17
Table 9: Correlates of Perceived Personal Development during Basic Training in Study 2.....	18

Acknowledgments

The authors wish to thank the headquarters, regimental, and battalion staff personnel who assisted with research efforts at the Marine Corps Recruit Depot, San Diego. We especially wish to thank Colonel H.C. Stackpole, Lieutenant Colonel D. Ammons, Captain W.G. Podolsky, First Lieutenant S.R. Peitzak, and HMI D. Schmidt. Our special thanks is also given to the Drill Instructors and recruits who participated in these studies.

INTRODUCTION

Marine Corps basic training (hereafter, BT) is commonly viewed as more stressful than that of other military services. The Armed Services Subcommittee on Military Personnel and Training of the United States House of Representatives has recommended that the Marine Corps a) isolate the positive aspects of BT stress and b) identify any individual stresses with questionable effects (1). This report is part of a project undertaken at the request of the Commandant of the Marine Corps to meet those objectives (2). Previous reports have described the identification of BT stresses and development of measures for those stresses (3,4). This report relates those measures to BT outcomes.

Research Approach

Stress can have many meanings in a setting as complex as BT. Our initial working definition of stress was any BT condition requiring substantial psychological adjustment or adaptation by recruits. Interviews with recruits identified a variety of specific conditions fitting this definition. Therefore, we have studied multiple stresses, rather than attempting to treat stress as a single general aspect of BT. The stresses studied are listed and defined in Appendix A.

Specific stresses have been classified as "positive" or "negative" based on evaluations made by graduating recruits. The classification process can be described by paraphrasing a common comment made by graduating recruits when we interviewed them. BT was commonly viewed as "a good thing to have done, but I would never want to go through it again now that I know what it is like." This point is noted because "positive" stresses were not necessarily conditions that recruits liked. Instead, "positive stresses" were conditions that recruits felt had been beneficial. In many cases, these same conditions were initially difficult to deal with and a source of some distress. For example, having to follow strict rules and regulations was initially stressful for some recruits, but ultimately produced a feeling of personal improvement by learning self-discipline. The success of "meeting the challenge" transformed these potentially negative experiences into positive stresses.

In contrast, negative stresses were BT experiences that recruits did not like and which either did not contribute to a feeling of personal growth or which actively interfered with development of such a feeling.

Leadership and group cohesion are commonly recognized as important for effective functioning of military units. Our interviews with recruits made it evident that this generalization applied to BT. Leadership and group cohesion were also important because current stress theories propose that social factors can affect how a person reacts to stress. Therefore, measures of leadership characteristics and group cohesion were added to our research to ensure a complete, accurate representation of the psychologically significant aspects of BT as experienced by recruits (see Appendix A).

Leadership style and stress are not mutually exclusive categories of experiences. This fact posed a problem. Should leadership elements satisfying our definition of stress be classified as part of "leadership style" or as part of "stress"? We chose to classify stressful leadership behaviors as stresses. Our reasoning was that the central research issue is "What are the effects of BT stresses?" not "What are the effects of leadership?" Therefore, in this paper, the term "leadership style" will refer to leadership elements which are not stresses. This decision simplified the presentation and discussion of results.

The primary research questions addressed in this report were:

- (a) What impact does BT stress have on BT outcomes, including attitudes toward the Marine Corps, personal development during BT, BT performance, health during BT, and attrition following BT?
- (b) Do nonstress aspects of leadership or group cohesion modify the effects of BT stress?

METHOD

Sample

Two samples of recruits participated in separate studies. Informed consent was obtained from 413 of 438 (94.3%) recruits sampled from 32 platoons in the first study and 425 of 433 (98.2%) recruits sampled from 39 platoons in the second study.

Demographic Measures

Self-reports of age, education, and race provided basic recruit descriptions in both studies. The second study added number of times expelled from school, number of arrests, high school grades, club memberships, amount of work done outside school, and prior job history. These recruit attributes were added

to the set measured in the first study because previous research had shown them to be related to BT success (5,6). General Classification Test (GCT) scores obtained from Marine Corps records assessed general intelligence. Basic descriptions of the two samples are given in Table 1.

TABLE 1
DEMOGRAPHIC CHARACTERISTICS FOR THE TWO RECRUIT SAMPLES

	MEAN	STUDY 1 S. D. ^a	MEAN	STUDY 2 S. D. ^a
Age (in years)	18.7	1.7	19.1	1.9
Education (in years)	11.4	1.2	11.6	1.1
General Classification Test (GCT)	104.1	14.7	104.8	13.9
Race (percent of total)				
White	64.4	^b	56.9	•
Black	9.7	•	13.2	•
Hispanic	9.9	•	12.2	•
Other	3.2	•	4.0	•
No response	12.8	•	13.7	•

NOTE: In a sample of 2648 recruits, General Classification Test scores had a mean of 104.1 and a standard deviation of 16.6.

^aS. D. = Standard Deviation

^bNot applicable

Perceptions of Training

BT stresses, leadership, and group cohesion were measured with self-report paper-and-pencil scales developed specifically to reflect recruit perceptions of BT (3,4). Each scale consisted of several items describing a particular aspect of BT stress, leadership style, or group cohesion. Recruits indicated the strength of their agreement with the statement or the frequency of occurrence of the condition during BT. Agreement was indicated using a response scale ranging from 1 (Disagree Strongly) to 7 (Agree Strongly). Frequency of occurrence was indicated on a response scale ranging from 1 (Never) to 7 (Always). Two different response scales were used to provide a more meaningful response language for some questions which could best be answered in terms of frequency.

Responses to the individual items in a scale were averaged to provide an overall scale score. Scale scores could range from 1.00 to 7.00 for each scale. Details of the scale development and full descriptions of the questionnaires used in these two studies appear in previous reports (3,4). Definitions and example items for each scale are given in Appendix A. In the presentation of results, scales will be referred to by name.

Because the scales reflect recruits' reports of their experiences, the qualification "as perceived by recruits" applies to any description of BT based on these scales. These scales were administered to recruits the day prior to graduation. The obtained measures therefore represent an overall retrospective evaluation of BT. Furthermore, it is important to note that the data were obtained from successful recruits; recruits who failed BT may have had very different perceptions.

Some minor changes have been made since the first analyses in our initial study. First, items for the scales of "overload," "legitimate power," "punishment behavior," and "performance goals" were originally dichotomized to increase scale reliability (3). In the present analyses, these scales have been scored using the standard format. The minor losses in reliability are compensated by the ability to make direct comparisons to the second study to replicate key findings. Second, the lack of autonomy and rules emphasis scales were not scored originally due to marginal internal consistency. The internal consistency is adequate for analyses where results can be replicated in a second study.

Training Outcomes

Attitudes. BT experiences may produce positive feelings toward the Marine Corps and/or greater acceptance of Marine Corps standards and philosophy in recruits. Scales measuring "affiliation" (i.e., identification with the Marine Corps), acceptance of "authority," "commitment" to high levels of personal performance, and "satisfaction" with the Marine Corps were taken from prior research on BT (7,8) and general job satisfaction (9). These scales are described in Table A-3 of Appendix A. In the following sections, each scale will be referred to by just the word in quotation marks above.

Personal Development. Graduating recruits typically report increased self-esteem and increased social skills as a result of BT. Scales to measure these outcomes were developed for the second study. Definitions and example items are given in Table A-3 of Appendix A.

BT Performance. Standard Marine Corps tests provided the following performance measures:

(a) Academic tests were administered at the end of the first 2 1/2 weeks of BT and during the last two weeks.

(b) Physical fitness tests (based on pull-ups, sit-ups, and a timed run). These tests were administered at approximately the same time as the academic tests.

(c) Rifle marksmanship scores were the results of firing the M-16 for rifle qualification. This test was taken 4 1/2 weeks into BT.

(d) Drill Instructor ratings of Conduct (i.e., "... the degree and spirit with which the individual conforms to accepted standards of customs and usage. General bearing, attitude, interest, reliability, courtesy, cooperation, obedience, adaptability, influence on others, and moral fitness are all factors to be considered in evaluating a recruit's conduct," cf., 10) and Senior Drill Instructor Subjective Evaluation (SDISE) (i.e., "... a subjective appraisal of the recruit's day-to-day performance and application").

Health During BT. In the second study, health records were reviewed for a random sample of approximately 50 percent of the recruits in each platoon. Health measures included: (a) Number of illness incidents. Illness incidents were classified as upper respiratory infection (URI), trauma or injury (Trauma), or "other" (Other). The number of incidents for each type of illness was a separate variable in the analyses. (b) Total dispensary visits. (c) Number of days of light duty. (d) Number of days of bed rest.

Fleet Marine Force (FME) Attrition. Data on attrition following BT was obtained from Marine Corps records 3 1/2 years after the first study and 2 1/2 years after the second. Successful recruits were still in the Marine Corps or had successfully completed their enlistment at the time of follow-up. Behavioral attrites had been discharged from the Marine Corps for fraudulent enlistment, poor performance, unsuitability, or misconduct. In our analyses,

behavioral attrites were divided into those attriting during the first year following BT and those attriting after the first year. A planned comparison procedure following initial analyses of variance combined these two behavioral attrition groups to and contrasted them with FMF successes (see below). Other attrites were recruits discharged for reasons not included in the behavioral category. The "other" category consisted primarily of Marine Corps reservists and recruits attriting for medical reasons.

Analysis Procedures

Pearson product moment correlations were used for all analyses except those involving race, platoon membership, or attrition. For these analyses, the sample in each study was randomly split in half and parallel correlation analyses performed for each subsample. A significant association was significant at (a) the 5% level in all four subsamples or (b) the 1% level in both subsamples for any relationship investigated in only one study. The second criterion was required because some stress and attitude measures were included only in one of the two studies. This approach provides for replication within studies and, where possible, between studies.

One-way analyses of variance related race, platoon membership, and attrition to other variables. Attrition analyses used the split-half procedures described above. Initial group sizes were too small to obtain stable effect estimates for race and platoon membership if the split-half procedures were employed. Replication of race and platoon membership effects within studies was not done. Therefore, group differences are reported which were significant (a) beyond the 1% level in both studies or (b) beyond the 0.25% level when examined in only one study.

Significant results are reported as effect sizes. Effect size describes how well differences in a dependent variable (e.g., performance, attitudes) can be explained by a given stress, leadership or group cohesion scale. Effect size has been emphasized because a statistically significant result may provide only weak predictions when sample sizes are as large as in these studies. Effect size evaluations also make it possible to make more meaningful comparisons between the results of the correlation and the analysis of variance procedures. Cohen (11) has provided a "small," "moderate," or "large" classification for

effects for both types of analysis. This classification scheme will be used to describe the analysis results.

RESULTS AND DISCUSSION

Recruit Characteristics and Platoon Membership as Predictors of BT Stress, Leadership, Group Cohesion, and Attitudes. Although our BT experience measures were subjective in nature, they were intended to reflect actual differences in what happened to recruits during BT. If this intent was fulfilled, the reports of experiences should be more strongly related to platoon membership than to recruit characteristics. The expected effects of platoon membership were hypothesized on the basis of interviews with recruits and training personnel. These interviews indicated that Drill Instructors differed with respect to leadership style. Leadership style differences would be expected to influence reports on many of our measures of BT experiences if those measures are sensitive to the actual treatment a recruit received.

The expectation that reported BT experiences would not be strongly related to recruit characteristics was based on Janowitz's observations that BT is structured to treat all recruits alike (12, pp. 160, 165). Substantial associations between recruit characteristics and reported BT experiences could indicate either that (a) recruits were actually treated differently based on their social background or (b) recruits from different backgrounds were treated the same, but interpreted their experiences differently.

The results (Table 2) can be summarized as follows:

- Recruit characteristics were infrequent predictors of BT perceptions, attitudes toward the Marine Corps, and personal development. There were 6 significant associations, all small. These significant associations were limited to race and GCT. None of the remaining 8 recruit characteristics (see pp. 2-3) produced any significant results.
- Race differences showed no pronounced trend in favor of any race group. Whites reported less leader structuring than Hispanics (Study 1, 5.86 vs. 5.32; Study 2, 5.88 vs. 5.35) and greater loss of autonomy (Study 1, 4.94 vs. 4.62; Study 2, 4.39 vs. 3.95). Whites reported higher levels of surveillance than Blacks or Hispanics (5.15 vs. 4.45 and 4.68, respectively). Finally, Whites were more accepting of authority than Blacks (Study 1, 5.85 vs. 5.27; Study 2, 5.97 vs. 5.65).

- Platoon membership was generally a strong predictor of perceptions of BT. Sixteen of 22 (73%) scales showed significant platoon differences; 14 of these differences were large and 2 were medium.
- Platoon membership was not a general predictor of attitudes or personal development. Only 2 of 6 (33%) scales (affiliation and authority) were significantly related to platoon membership.

TABLE 2
RECRUIT CHARACTERISTICS AND PLATOON MEMBERSHIP
AS PREDICTORS OF BASIC TRAINING EXPERIENCES

		Study: 1	2	EFFECT SIZE
RACE	Leader Structuring	.18	.19	S ^h
	Loss of Autonomy	.14	.18	S
	Surveillance	.23	*** ^b	S
	Authority	.18	.14	S
GCT	Leader Structuring	.23 ^c	.19 ^c	S
	Feedback	.25 ^c	***	S
PLATOON MEMBERSHIP	Role Conflict	.34	.51	L
	Role Ambiguity	.37	.42	L
	Punishment Behavior	.42	.50	L
	Surveillance	.40	***	L
	Drill Instructor Unfairness	.45	***	L
	Skill Requirements	.35	.39	M
	Rules Emphasis	.37	.40	L
	Performance Goals	.32	.42	M
	Purpose	***	.49	L
	Leader Structuring	.40	.48	L
	Leader Support	.44	.61	L
	Referent Power	.43	.44	L
	Expert Power	.34	.43	L
	Reward Power	.42	***	L
	Group Teamwork	.39	.54	L
	Group Support	.50	.51	L
	Affiliation	.33	.40	M
	Authority	.33	.42	L

^aEffect size is small (.1), medium (.3), or large (.5) following the guidelines provided by Cohen (11). Table entries are η^2 s from the analyses of variance for Race and Platoon Membership and Pearson product-moment correlations for GCT.

*** indicates that the variable was not included in the study.

^cTable is the weaker of two correlations (see Methods). Individual correlations for GCT and Leader Structuring were: $r = .22$ and $r = .23$ for Study 1, and $r = .18$ and $r = .23$ for Study 2. For GCT and Feedback, the correlations were $r = .26$ and $r = .23$.

Our measures of BT experiences evidently are sensitive to actual differences in BT treatment. Platoon differences in perceptions of BT will occur when (a) recruits within individual platoons tend to agree with one another in their

descriptions of BT and (b) the consensus in one platoon is different from that in other platoons. These conditions could be met if Drill Instructors in different platoons treat recruits differently. However, the conditions could also be met if recruits in one platoon are different from those in other platoons in some way that affects their perceptions of BT.

Recruit differences are not a plausible explanation for platoon differences in BT perceptions. Analyses, which will not be reported in detail, showed that recruits were similar across platoons except for GCT scores. Taking GCT differences into account did not change the results of the analyses described above.

Finally, the few BT experiences that did not differ across platoons may actually be comparable for all platoons. These BT experiences may arise primarily from the task structure of training which is common to all recruits (e.g., classes, PT requirements) rather than the behaviors of individuals who are unique to particular platoons.

A recruit's personal characteristics and social background were not strongly related to BT perceptions. However, because some significant associations were found for race and GCT, the platoon membership analyses reported here and all subsequent analyses were carried out both with and without corrections for race and GCT. These corrections did not alter our findings, so there will be no further reference to this topic. Other possible effects of recruit characteristics are considered in the section dealing with possible modifiers of BT stress-BT outcome relationships (pp. 20-21).

Overall, our self-report measures of BT experience appear sensitive to real differences in treatment during BT and insensitive to biases which might arise from social background differences. This issue has been treated in detail at this point to provide background for interpreting the results reported in later sections of this paper.

BT Stress Levels. Recruits endorsed statements describing positive stresses more strongly than statements describing negative stresses (Table 3). Specifically,

- Combining the two studies, the highest average rating for a negative stress was 5.36 for Punishment Behavior; 3 of 5 positive stresses had higher averages (Effort Requirements, Performance Goals, Rules Emphasis).

- Two of 7 negative stresses had average scores below the scale midpoint (i.e., 4.0). No positive stress was rated that low.

TABLE 3
DESCRIPTIVE STATISTICS FOR STRESS SCALES

	STUDY 1		STUDY 2	
	MEAN	S. D.	MEAN	S. D.
<i>POSITIVE BT STRESSES</i>				
Effort Requirements	5.91	0.97	5.79	0.92
Ability Requirements	5.19	1.31	4.57	1.06
Performance Goals	6.38	0.63	6.53	0.51
Rules Emphasis	5.81	1.01	5.81	0.80
Purpose	**	** ^d	4.92	1.31
<i>NEGATIVE BT STRESSES</i>				
Overload	5.42	1.00	4.61	0.94
Role Ambiguity	2.45	1.06	2.33	0.93
Role Conflict	4.86	1.21	3.88	0.97
Surveillance	5.03	1.09	**	**
Drill Instructor Unfairness	3.91	1.20	**	**
Punishment Behavior	5.72	1.01	4.99	1.09
Loss of Autonomy	4.91	1.17	4.33	0.89

NOTE: See Appendix A for scale definitions and example items. Scale scores can range from 1.00 to 7.00.

^d ** indicates that the scale was not included in the study.

Recalling that the questionnaire stress measures are subjective reports, recruits view positive stresses as more characteristic of BT than negative stresses. In these studies, recruits were asked to indicate how well each questionnaire statement described their overall BT experiences. Under these instructions, if a recruit agrees "strongly" with statement A, describing a positive stress, but only agrees "somewhat" with statement B, describing a negative stress, the inference that positive stress was subjectively more common than the negative stress seems reasonable.

Our interpretation of the results in Table 3 applies to BT as a whole. Our prior interviews indicate that negative stress predominates early in BT. At the end of BT, however, overall evaluations indicate that positive stress is

more characteristic of the total experience. This is not due to poor recall of negative stresses. Interviews with recruits (3) and phase-by-phase questionnaire ratings of stress using our questionnaire (4) show they do recall negative stresses.

Another factor which could affect the results is that recruits may produce a biased description of BT because they are unwilling to make negative statements about their experiences. One means of checking on this possibility is to determine whether the stress scale scores are correlated with a tendency to make "socially desirable" statements. In another study, we found that scores on a social desirability scale were not strongly related to scores on our stress measures. Almost all correlations were less than $r = .20$ in absolute value except for role ambiguity and effort requirements which had correlations in the $r = .20$ to $r = .30$ (absolute) range. Even the correlations for role ambiguity and effort requirements were not large enough to suggest serious biasing. The general conclusion that social desirability is not a major source of response biases applies not only to stresses, but to the other measures mentioned in this report.

Finally, this is an appropriate point to restate the fact that the data in these studies represent the views of successful recruits. Recruits who failed training could not be included in the study because data were obtained only at the end of BT. These attriting recruits may have had very different perceptions of BT. A report in preparation will show that recruits who are dropped from BT do perceive slightly higher levels of stress than successful recruits (13). Whether this difference would have been carried over to the later phases of training if these unsuccessful recruits had been retained is an open question. Nevertheless, the difference does make it evident that the results presented here and in the following sections should be qualified by that statement "among BT graduates."

BT Leadership and Group Cohesion. Recruits have positive perceptions of BT leadership (Table 4). The results can be summarized as follows:

- The most characteristic aspect of BT leadership was expertise.
- Drill Instructors were also rated high on providing guidance on what to do and how to do it (Leader Structuring), setting a good example of what a Marine should be (Referent Power), and having the legitimate right to give orders (Legitimate Power).

- Somewhat lower ratings were given with respect to providing performance feedback and using punishment to control recruits.
- The positive view of BT leadership contrasts with relatively neutral perceptions of group teamwork and group support.

TABLE 4
DESCRIPTIVE STATISTICS FOR LEADERSHIP AND GROUP COHESION SCALES

	STUDY 1		STUDY 2	
	MEAN	S. D.	MEAN	S. D.
LEADERSHIP				
Leader Structuring	5.45	1.04	5.47	0.97
Leader Support	5.47	1.06	5.13	1.27
Feedback	5.16	1.15	..a	..
Referent Power	5.14	1.19	5.80	1.03
Expert Power	6.56	0.73	6.56	0.63
Reward Power	5.14	1.38	..	..
Coercive Power	5.21	0.95	..	..
Legitimate Power	6.02	0.81	..	..
GROUP COHESION				
Group Teamwork	4.87	1.32	4.53	1.26
Group Support	4.13	1.12	3.92	1.13

NOTE: See Appendix A for scale definitions and example items. Scale scores can range from 1.00 to 7.00.

..a indicates that the scale was not included in the study.

Recruits clearly viewed BT leadership positively. Group cohesion scores were surprisingly low, but consistent across the two studies. However, Bourne (14) has noted that the intensity of friendships may diminish at the end of BT. Thus, the low group cohesion scores may be partly due to the fact that our measures were obtained just prior to graduation.

Attitudes and Personal Development. Recruit attitudes were positive at the end of BT. This statement is particularly true for improved self-esteem and social skills and commitment to maintaining a high level of personal performance (Table 5). General satisfaction with the Marine Corps and a sense of identification and affiliation with the Marine Corps received moderately positive ratings.

TABLE 5
DESCRIPTIVE STATISTICS FOR ATTITUDES TOWARD THE MARINE CORPS
AND PERCEIVED PERSONAL DEVELOPMENT MEASURES

	STUDY 1		STUDY 2	
	MEAN	S. D.	MEAN	S. D.
Affiliation	4.77	1.38	5.27	1.70
Commitment	6.67	0.67	6.71	0.55
Authority	5.80	1.05	5.93	0.86
Satisfaction	5.92	1.13	5.86	1.11
Self Esteem	**	***	6.52	0.72
Social Skills	**	**	**	1.07

* = significant at the .05 level; ** = significant at the .01 level; *** = significant at the .001 level.

† = not significant.

Recruit Performance. Recruit performance results are presented in Table

4. The primary findings were:

- The average recruit performed well above the Marine Corps' minimum standards. Based on maximum possible score, the average recruit qualification score was 6% higher than passing. Average fitness and physical examination scores were 27% to 74% above passing. Assuming that a Drill Instructor rating of 3.00 is passing, each of these ratings averaged more than 30% above passing.
- Recruits performed better at the end of BT than at the beginning. Fitness gains were 25.1% in the first study and 24.2% in the second. Academic performance improvement was determined by combining the two third phase tests and comparing them to the first phase. Improvements were 6.5% and 8.0% for the two studies. All changes were highly significant statistically ($p < .001$).

TABLE 6
DESCRIPTIVE STATISTICS FOR RECRUIT PERFORMANCE MEASURES

	n ^a	STUDY 1 MEAN	S. D.	n ^a	STUDY 2 MEAN	S. D.
<i>PRACTICAL EXAMINATIONS</i>						
Phase I	396	87.88	8.04	416	88.70	8.30
Phase III - Oral	357	47.92	2.75	423	48.43	2.43
Phase III - Written	357	45.68	3.48	423	47.35	2.85
<i>PHYSICAL FITNESS</i>						
Phase I	340	173.28	41.33	396	188.67	44.61
Phase III	371	216.82	38.96	420	234.30	39.31
<i>RIFLE QUALIFICATION</i>						
M-16 Score	380	201.71	13.83	417	201.66	21.43
<i>DRILL INSTRUCTOR RATINGS</i>						
Conduct	235	4.23	0.25	174	4.23	0.31
Sr. DI Subj. Eval. ^b	281	4.17	0.31	265	4.24	0.31

^aThe number of participants for whom scores were available varied substantially due to missing data in the platoon records. The number of recruits for whom a score was available has therefore been indicated for each performance measure.

^bSr. DI Subj. Eval. = Senior Drill Instructor Subjective Evaluation

Graduating recruits acquired basic military knowledge and skills and improved their physical fitness during BT. Average performance levels were well above the minimum Marine Corps standard, except for the physical fitness test given after 2 weeks of BT. Both studies showed a major increase in fitness from the time of this first test to the test taken in the last 2 weeks of training. In the first study the increase was 25% and in the second it was 24%. Physical fitness gains are a positive BT effect.

One aspect of the findings presented in Table 6 potentially represents an effect of stress on BT performance. Because negative stresses are highest early in BT (3,4), lower first phase academic performance could be due to stress. However, other explanations are also possible (e.g., differences in test difficulty, familiarity with the type of test).

BT Stresses as Predictors of Attitudes toward the Marine Corps.

Significant relationships between BT stresses and attitudes toward the Marine Corps are described in Table 7.

The primary findings for positive stresses were:

- Nine of 20 (45%) correlations were significant.
- High positive stress predicted more positive attitudes toward the Marine Corps as indicated by the positive correlations.
- Only ratings of the amount of ability required to satisfy BT performance standards (i.e., "Ability Requirements;" cf., Appendix A) failed to predict at least one attitude.

The main findings for negative stresses were:

- Seven of 28 (25%) negative stress correlations were significant.
- Higher levels of negative stress predicted less positive attitudes toward the Marine Corps.
- Three of 7 negative stresses (Surveillance, Punishment Behavior, Loss of Autonomy) did not predict any attitude.
- Only Drill Instructor unfairness produced more than one significant association.

TABLE 7
BASIC TRAINING STRESS CORRELATES
OF ATTITUDES TOWARD THE MARINE CORPS

		STUDY 1		STUDY 2		EFFECT SIZE
Attitude	Group:	A	B	A	B	
NEGATIVE STRESSES						
Role Conflict	Satisfaction	-.17	-.24	-.30	-.15	S ^d
Role Ambiguity	Satisfaction	-.27	-.39	-.27	-.24	S
Overload	Satisfaction	-.17	-.27	-.18	-.15	S
Drill Instructor Unfairness	Affiliation	-.36	-.36	.. ^{a,b}	.. ^a	M
	Authority	-.23	-.44	.. ^a	.. ^a	M
	Commitment	-.24	-.28	.. ^a	.. ^a	S
	Satisfaction	-.43	-.45	.. ^a	.. ^a	M
POSITIVE STRESSES						
Skill Requirements	Affiliation	.23	.28	.17	.24	S
	Authority	.29	.41	.16	.15	S
	Satisfaction	.33	.36	.28	.30	M
Purpose	Authority	.. ^a	.. ^a	.26	.21	S
	Commitment	.. ^a	.. ^a	.31	.17	S
	Satisfaction	.. ^a	.. ^a	.40	.22	M
Performance Goals	Authority	.38	.26	.22	.16	S
	Satisfaction	.38	.18	.23	.20	S
Rules Emphasis	Authority	.35	.39	.22	.27	M

NOTE: Sample size for each correlation is $n = 200$ or more. Individual correlations are significant at the 5% level if $r = .14$ and at the 1% level if $r = .17$.

^dEffect size is small (S), medium (M), or large (L) following the guidelines provided by Cohen (11). Effect size is based on the average of the correlations.

^b... indicates that the predictor variable was not included in the study.

Although BT stresses significantly predicted attitudes toward the Marine Corps, 10 of 16 significant effects were small, thus indicating relatively weak predictive relationships (see the last column of Table 7). Drill Instructor unfairness produced moderately large associations for affiliation, authority, and satisfaction. No other stress produced more than one moderately large effect.

It is now evident that positive stresses are both more characteristic of BT than negative stresses and about twice as likely to significantly predict attitudes toward the Marine Corps. The low level of negative BT stresses does not explain their limited impact. Drill Instructor unfairness is less common than some other negative stresses, but still significantly predicted attitudes. The Drill Instructor unfairness results are considered further in the next section. The limited predictive power of the other negative stresses may arise because they occur in an environment with substantial positive stresses. In this type of setting, negative stresses may be a relatively unimportant nuisance factor. These observations may help explain the positive attitudes observed at the end of BT despite the presence of stressful conditions.

BT Leadership and Group Cohesion As Predictors of Attitudes toward the Marine Corps. The significant associations between leadership and group cohesion and attitudes toward the Marine Corps are presented in Table 8. Key findings for leadership were:

- Seventeen of 32 (53%) of the leadership correlations were significant.
- Ten of 17 significant effects were moderate in size; the remainder were small.
- High scores on the leadership variables consistently predicted more positive attitudes.

Key findings for group cohesion were:

- Only 4 of 24 of the group cohesion correlations were significant.
- Higher levels of group teamwork and group support were both weak predictors of high satisfaction with the Marine Corps.

Overall, leadership variables significantly predicted attitudes toward the Marine Corps as well as the positive stresses did, but the leadership predictions were stronger. The importance of leadership as a predictor of attitudes toward the Marine Corps is underscored when it is noted that Drill

Instructor unfairness is a leadership behavior as well as a stress. Leadership variables and the positive stresses are not strongly correlated (cf., 3,4), so these two types of predictors contribute independently to positive attitudes toward the Marine Corps. Overall, however, leadership appears to be the most important BT factor affecting attitudes toward the Marine Corps.

TABLE 8
LEADERSHIP AND GROUP COHESION CORRELATES
OF ATTITUDES TOWARD THE MARINE CORPS

	Attitude	Group	STUDY 1		STUDY 2		EFFECT SIZE
			A	B	A	B	
LEADERSHIP VARIABLE							
Leader Structuring	Satisfaction		.24	.39	.20	.14	S ^a
Leader Support	Affiliation		.29	.29	.27	.13	S
	Authority		.27	.42	.24	.22	S
	Satisfaction		.33	.35	.35	.29	M
Expert Power	Affiliation		.31	.18	.31	.16	S
	Authority		.47	.47	.26	.25	M
	Commitment		.51	.27	.23	.23	M
	Satisfaction		.47	.32	.33	.28	M
Referent Power	Affiliation		.41	.38	.41	.26	M
	Authority		.40	.45	.47	.26	M
	Satisfaction		.53	.43	.48	.34	M
Legitimate Power	Affiliation		.18	.17	..	..	S
	Authority		.16	.30	..	..	M
Reward Power	Affiliation		.19	.18	..	..	S
	Authority		.17	.43	..	..	M
	Commitment		.24	.21	..	..	S
	Satisfaction		.26	.37	..	..	M
GROUP COHESION							
Group Teamwork	Satisfaction		.14	.28	.20	.37	S
Group Support	Satisfaction		.16	.27	.14	.30	S

NOTE: Sample size for each correlation is $N = 200$ or more. Individual correlations are significant at the .5 level, $t = 1.96$, or at the .1 level, $t = 2.57$.

^aEffect size is small (S), medium (M), or large (L) following the guidelines provided by Cohen (11). Effect size is based on the average of the correlations.

.. indicates that the predictor variable was not included in the study.

Predictors of Perceived Personal Development. Perceived personal development was investigated only in the second study. Results of analyses in that study indicated the following:

- Six of 10 (60%) correlations to positive stresses were significant (Table 9). Positive stresses predicted greater feelings of personal development except in the case of ability requirements which were not related to personal development.
- Only one of 14 (7%) negative stress correlations was significant. Role ambiguity was associated with less feeling of personal development.
- Only 3 of the 16 (19%) leadership correlations were significant. Recruits who felt their Drill Instructors were expert and set good examples of what a Marine should be reported more personal development.
- Group cohesion variables were not significant predictors of personal development.

TABLE 9
CORRELATES OF PERCEIVED PERSONAL DEVELOPMENT
DURING BASIC TRAINING IN STUDY 2^a

		Group	A	B	EFFECT SIZE
<i>NEGATIVE STRESSES</i>					
Role Ambiguity	Social Skills		-.19	.22	S ^b
<i>POSITIVE STRESSES</i>					
Effort Requirements	Self Esteem		.24	.25	S
	Social Skills		.22	.28	S
Performance Goals	Self-Esteem		.42	.32	M
	Social Skills		.26	.20	S
Purpose	Social Skills		.19	.18	S
Rules Emphasis	Self-Esteem		.24	.28	S
<i>LEADERSHIP</i>					
Referent Power	Social Skills		.32	.32	M
Expert Power	Self-Esteem		.37	.19	S
	Social Skills		.35	.25	M

NOTE: Sample size for each correlation is $n = 200$ or more. Individual correlations are significant at the 5% level if $r \geq .14$ and at the 1% level if $r \geq .17$.

^aThe personal development measures were not included in study 1.

^bEffect size is small (S), medium (M), or large (L) following the guidelines provided by Cohen (11). Effect size is based on the average of the correlations.

As a group, positive stresses showed the most consistent tendency to predict feelings of personal development. Broadly speaking, the correlations to positive stresses can be interpreted as showing that being challenged by BT is important for personal improvement. This association was suggested by a variety of comments in our initial interviews with graduating recruits. The personal development scales were included in the second study specifically to test the association between training challenge and personal development.

The leadership correlates of perceived self-improvement call to mind the recruiting theme of "becoming one of a few good men." A large number of recruits probably enter BT with this as one objective. Because BT success makes the recruit a Marine, BT graduates can reasonably believe that they have taken on or have proven they possess the attributes of a Marine. Drill Instructors provide specific examples of what Marines are like, so recruits probably see becoming a Marine as equivalent to becoming like their Drill Instructors. The better the example provided by the Drill Instructors, the more positive the recruit's self-perceptions should be. This possibility was one reason for including Drill Instructor expert power and referent power measures in our research. Given our interpretation, it is important to note that the examples provided by Drill Instructors differ in degree, not type. All Drill Instructors were viewed positively, but some more so than others. Therefore, the fact that the average recruit reports substantial self-improvement during BT (see p. 12 above) is not surprising.

BT Experiences as Predictors of BT Performance, BT Health, and FMF Success. Relationships between BT experiences and BT performance and health measures were determined using the same correlational procedures applied to attitudes and personal development. In addition, BT experiences were related to FMF success by comparing the average scores of FMF successes, FMF behavioral attrites, and FMF "other" attrites (see p. 5). **BT stress, leadership, and group cohesion did not predict BT performance, BT health, or success in the FMF.**

The absence of any significant association between BT experiences and outcomes other than attitudes toward the Marine Corps and perceived personal development is important. Evidently factors other than stresses (e.g., exposure to new viruses, unusual physical activity, previous schooling, FMF experiences)

are the primary determinants of BT health, performance, and later FMP success. **Evaluations of the usefulness of BT stresses must therefore be based on outcomes other than performance and health during BT or FMP success.**

Reviewing these two studies, there is only one hint of a possible BT stress-performance relationship. This was the observation that academic performance was lower during the first phase of BT than during the last phase. Information from other studies in this research program indicates that negative stresses are higher during the early phases of BT. This higher level of stress is therefore one possible explanation of the lower performance at the end of the second week of BT. However, there are so many other possible differences between the first and last phase of BT that the observed early-late difference in academic performance cannot be attributed to stress with any confidence.

Effects of Possible Modifiers of BT Stress-BT Outcome Relationships. The preceding analyses have assumed that all recruits react the same when exposed to a given stress. This assumption may be inappropriate. If so, our earlier descriptions of BT stress-BT outcome relationships would have to be modified. For example, the conclusion that "Positive stresses produce feeling of personal improvement" might have to be modified to read "Positive BT stresses produce feeling of personal improvement, but the effect is much stronger in recruits of high intelligence than among those of low intelligence." If many such qualifications were necessary, our previous conclusions would be significantly altered.

A series of analyses was carried out to determine whether substantial qualifications were required. The basic procedure was to identify a factor which might affect reactions to stress, then group recruits into general categories based on that factor. For example, general intelligence as measured by the GCT might affect how a recruit reacts to stress. Therefore, we grouped recruits into high, medium and low categories based on their GCT scores and compared the BT stress-BT outcome correlations obtained in the different groups. If the correlation in one group was significantly different from that in another group, there would be a basis for modifying our prior conclusions. Similar analyses were carried out grouping recruits on the basis of age, race, education, length of time in the institution, place of home town, past pattern of delinquent behavior, past

pattern of pro-social behavior, leadership style in BT, and group cohesion in BT (see Appendix B).

Although the analyses were extensive, the results can be quickly summarized. BT stress-BT outcome relationships were not modified substantially by recruit characteristics, leadership style, or group cohesion (see Appendix B). Although there were some significant differences between groups in each study, none of these differences replicated across the two studies. At this time, our general conclusions regarding BT stress-BT outcome associations can be applied to all types of recruits.

CONCLUSIONS

This report presented data from two studies in a research program to (a) identify stresses in Marine Corps BT and (b) determine the positive and negative effects of those stresses. The two studies described here provided data to evaluate the effects of BT stresses.

In these studies, stresses initially were classified as positive or negative based on interview statements made by graduating recruits. Positive stresses included effort requirements, ability requirements, high performance goals, emphasis on rules and regulations, and a feeling that the pressure of BT had a purpose. Negative stresses were overload and pressure, not knowing what to do or how to do it, getting different orders from different people, being closely watched for mistakes, being punished, being treated unfairly, and losing control of one's life. Because our findings generally confirmed the appropriateness of these initial classifications, the results will be summarized in terms of the general categories of positive and negative stress.

The findings summarized here should be interpreted cautiously for several reasons. Our measures of stress, leadership, and group cohesion were retrospective reports of BT experiences. These measures were subjective and represented only the views of successful recruits. These facts may have affected the measurement of BT experiences because evaluations of BT experiences may be different after successfully completing training than they are during BT. Also, there may have been selective recall or simple memory errors for key experiences. Finally, unsuccessful recruits may have perceived BT differently and/or reacted differently to their perceptions.

While the preceding qualifications are real concerns, we have shown that our measures were related to platoon membership and only weakly related to social background factors which might bias stress reports. Platoon membership effects are assumed to represent the influence of real differences in experience introduced by the behavior of Drill Instructors and other recruits in the platoon. Data from other studies in this program indicate that psychological bias factors (e.g., social desirability) have little effect on reports of BT experiences and that recruits clearly recall the general nature of their BT experiences, including their earliest experiences. Given these facts, one can reasonably feel that our measures reflect real differences in BT experiences. The conclusions resulting from relating these measures of BT experiences to BT outcomes were:

(a) Statements regarding positive stresses were endorsed more strongly than statements describing negative stresses. This fact suggests that recruits feel positive stresses characterize their overall BT experiences more than negative stresses. Other evidence indicates that negative stresses predominate in the early phases of BT. Therefore, it should be remembered that the trends noted here represent the description of BT as a whole.

(b) Recruits felt they received high quality leadership. The single most characteristic aspect of BT leadership was expertise. Recruits also felt that Drill Instructors provided good examples of what a Marine should be, provided a high level of guidance regarding what to do and how to do it, and had the legitimate right to expect orders to be followed.

(c) The emphasis on positive stress and good leadership contributed to better attitudes toward the Marine Corps and greater feelings of personal development. The most important leadership predictors of attitudes were having Drill Instructors who were viewed as experts at their jobs and as good examples of what a Marine should be. The most important positive stresses were having to meet high performance goals, having to follow rules and regulations closely, feeling that effort was required to meet BT requirements, and seeing BT stresses as having a useful purpose. These stresses had initially been classified as positive on the basis of interviews with graduating recruits. Confirming that these BT stresses were related to positive BT outcomes helps achieve the project objective of identifying stresses with positive effects (see p. 1).

(d) Negative stress effects were minor except for the influence of Drill Instructor unfairness on attitudes toward the Marine Corps. Appropriate selection and training of Drill Instructors is probably the best means to minimize negative BT stresses and their effects. Previous reports have described significant associations between the negative stresses and leadership (3,4). These associations can be interpreted as evidence that leadership style contributes to the occurrence of negative stresses. This point is highlighted by the fact that Drill Instructor unfairness is clearly an element of leadership style as well as a stress. The overall positive perceptions of Drill Instructors and relatively low levels of negative stresses reported by recruits in these two studies suggest that current Drill Instructor selection and training procedures already tend to minimize negative stresses and keep them from being a significant factor in BT outcomes.

(e) BT stresses and leadership did not significantly affect BT performance, BT health, or success in the FMF. In the absence of any significant correlations with other BT outcomes, the evaluation of the utility or impact of BT stresses must rest on their relationship to attitudes. Assuming that the development of positive attitudes toward the Marine Corps and feelings of personal improvement are important BT objectives, then, overall, BT stress effects are positive.

(f) Group cohesion was relatively low in BT, but this does not affect BT outcomes. The overall low level of cohesion and its evident lack of influence on BT outcomes were both unexpected, but consistent across the two studies.

(g) The overall effects of BT were positive despite any stresses the recruits encountered. Recruits left BT with the necessary basic military skills and knowledge, increased physical fitness, positive attitudes toward the Marine Corps, and a feeling of personal improvement.

(h) The associations between BT stresses and BT outcomes described above apply to all recruits. Theoretically, BT stresses might have more effect on some recruits than others (p. 20). If so, an accurate description of BT stress effects would require separate statements for different groups of recruits, e.g., one for high school graduates and one for nonhigh school graduates. Our analyses produced no evidence that our general statements required qualification.

Our overall interpretation of the findings is that BT produces positive attitudinal outcomes because positive stress is more characteristic of BT than negative stress and because recruits receive high quality leadership. Performance measures indicate that basic military skills and knowledge are learned well above minimal requirements and substantial gains in physical fitness are achieved. However, these performance outcomes are not related to perceived BT stresses. **Thus, among graduating recruits the net effects of BT are positive and only weakly dependent on BT stress.** Our conclusions are limited by the use of retrospective measures of BT experiences obtained from a sample including only graduating recruits. Subsequent studies in this project measured stress repeatedly during BT to verify the present findings and to determine whether BT stresses are associated with BT attrition.

REFERENCES

1. United States House of Representatives Subcommittee on Military Personnel. Marine Corps' Recruit Training and Recruiting Programs. Washington, D.C.: U.S. Government Printing Office, September 29, 1976, p. 30.
2. Commandant, Marine Corps. Letter OTT132-mlr of 6 January 1977.
3. Vickers, R.R., Jr. & Ryman, D.H. Development of a Questionnaire to Measure Psychological Stress and Related Concepts in the Context of the Marine Corps Basic Training Setting. San Diego, CA: Naval Health Research Center, Technical Report 80-12, 1980.
4. Wallick, M.T., Vickers, R.R., Jr. & Ryman, D.H. Revision of a Questionnaire to Measure Stress and Related Aspects of Basic Training. San Diego, CA: Naval Health Research Center, Technical Report 82-25, 1982.
5. Plag, J.A. Pre-enlistment variables related to the performance and adjustment of Navy recruits. Journal of Clinical Psychology, 1962, 18, 168-171.
6. LaRocco, J.M., Ryman, D.H. & Biersner, R.J. Life history and mood as predictors of adjustment in Navy recruit training. Journal of Community Psychology, 1977, 5, 46-51.
7. Booth, R.F. & Holberg, A. Structure and measurement of Marine recruit attitudes. Journal of Applied Psychology, 1974, 59, 236-238.
8. Drucker, E.H. A longitudinal study of attitude change and alienation during basic combat training., Washington, D.C.: Human Resources Research Organization, Technical Report 74-15, June 1974.
9. Quinn, R.P. & Shepard, L.J. 1972-1973 Quality of Employment Survey: Descriptive Statistics with Comparison Data from the 1969-1970 Survey of Working Conditions. Ann Arbor, MI: Institute for Social Research, 1974.

10. United States Marine Corps. Standard Operating Procedure for Male Recruit Training, 1 January 1977.
11. Cohen, J. Statistical Power Analysis for the Behavioral Sciences. N.Y.: Academic Press, 1969.
12. Janowitz, M. Basic education and youth socialization in the Armed Forces. In R. Little (ed.), A Survey of Military Institutions. Chicago: Inter-University Seminar on Armed Forces and Society, 1969, pp. 131-169.
13. Vickers, R.R., Jr., Hervig, L.K., Wallick, M.T. & Conway, T.L. The Marine Corps Basic Training Experience: A Longitudinal Study of the Effects of Basic Training Stresses. San Diego, CA: Naval Health Research Center, in preparation.
14. Bourne, P.G. Some observations on the psychosocial phenomena seen in basic training. Psychiatry, 1967, 30, 187-196.
15. House, R.J., Jr. A path-goal theory of leader effectiveness. Administrative Science Quarterly, 1971, 16, 321-338.
16. Cobb, S. Social support as a moderator of life stress. Psychosomatic Medicine, 1976, 38, 300-314.
17. Hays, W.L. Statistics for Psychologists. N.Y.: Holt, Rinehart and Winston, 1963.

Appendix A

OPERATIONAL DEFINITIONS FOR QUESTIONNAIRE MEASURES

Table A-1

OPERATIONAL DEFINITIONS FOR BASIC TRAINING STRESS SCALES

Positive Basic Training Stresses

Effort Requirements: Perceiving basic training as requiring both skill and effort to succeed.

Example Items: (a) Training required skill and effort to do well.
(b) Training was very physically demanding.

Ability Requirements: Perceiving basic training as requiring the use of one's skills and abilities and/or as developing skills and abilities.

Example Items: (a) Training was dull and boring.
(b) There was a chance to show your best abilities.

Performance Goals: Emphasis by Drill Instructors on not merely meeting basic performance requirements, but consistently exceeding these requirements to achieve the highest possible level of performance.

Example Items: (a) Drill Instructors insisted on high standards of performance.
(b) The Drill Instructors wanted you to do more than just pass an exam or prac.

Rules Emphasis: An emphasis on closely following rules and regulations and receiving punishment for even minor infractions; placing more importance on following the rules than on simply getting the job done.

Example Items: (a) There was a strict emphasis on following rules and regulations.
(b) Even minor rules and regulations were very strictly enforced.

Purpose: The extent to which recruits felt there were good reasons for the amount and type of stress they encountered in basic training.

Example items: (a) Boot camp determines which recruits will not stand up to combat.
(b) The reason for Drill Instructors toughness and harshness was to develop mental and physical conditioning in recruits.

Negative Basic Training Stresses

Overload: The extent to which there was more work to be done than could be accomplished in the time available; pressure and hurrying to get things done.

Example items: (a) There were tight time schedules with pressure to get things done on time.
(b) It was impossible to complete a job in the time given.

Role Ambiguity: Not knowing clearly what behaviors were expected; being uncertain of what to do, how to do it, or why it had to be done.

Example items: (a) Orders and explanations were clear about what had to be done. (Reverse scored)
(b) Rules and decisions were clearly explained. (Reverse scored)

Table A-1

OPERATIONAL DEFINITIONS FOR SCALES BASIC TRAINING STRESS SCALES

(continued)

Role Conflict: Receiving different, mutually exclusive orders with regard to tasks, goals, or procedures; being pressured by other recruits to do things differently than the Drill Instructors wanted.

Example items: (a) I received conflicting orders about what to do from different Drill Instructors.
(b) I had to do things in a way that was acceptable to one Drill Instructor, but not another.

Surveillance: The extent to which Drill Instructors were perceived as constantly watching the recruits to see if they made mistakes.

Example Items: (a) Recruits were constantly checked on for rule violations.
(b) Drill Instructors are always just waiting for somebody to make a mistake.

Drill Instructor Unfairness: The extent to which Drill Instructors did not treat all recruits the same and/or punished recruits for the mistakes of others or punished recruits even when they tried hard.

Example Items: (a) The Drill Instructors sometimes punished recruits for others mistakes.
(b) Our Drill Instructors dealt fairly with all the recruits in the platoon. (Reverse scored)

Punishment Behavior: The extent to which Drill Instructors quickly and consistently punished poor performance.

Example Items: (a) Drill Instructors criticized poor work.
(b) Drill Instructors used threats and fear to motivate us.

Loss of Autonomy: The extent to which discipline was extended to areas the recruit felt were not appropriate; loss of a feeling of personal control over one's life and/or loss of recognition as a person.

Example Items: (a) Recruits were treated like children.
(b) I was treated as an individual. (Reverse scored).

Table A-2

OPERATIONAL DEFINITIONS FOR LEADERSHIP AND GROUP COHESION SCALES

Leadership and Group Cohesion Variables

Leader Structuring: The extent to which Drill Instructors provided means-end structuring in the form of detailing who was to do what and when.

Example Items: (a) Our Drill Instructors told us exactly how to do things.
(b) Drill Instructors told us why things had to be done.

Leader Support: The extent to which Drill Instructors communicate a concern for the well-being of the recruits and a respect for the platoon.

Example Items: (a) The Drill Instructors were interested in our welfare.
(b) The Drill Instructors were proud of the platoon and the recruits in it.

Feedback: The amount of information that the Drill Instructors provided the platoon with regard to progress and future work requirements.

Example Items: (a) Drill Instructors let recruits know how well they were doing.
(b) Drill Instructors were specific about what types of mistakes recruits made.

Referent Power: The extent to which Drill Instructors are regarded as setting a good example which the recruits want to copy.

Example Items: (a) I would like to be like my Drill Instructors.
(b) I respect my Drill Instructors as people.

Expert Power: The extent to which Drill Instructors were expert and knowledgeable in their job.

Example Items: (a) My Drill Instructors are well-qualified for their jobs.
(b) My Drill Instructors are very good at what they do.

Reward Power: The amount of credit or reinforcement that Drill Instructors gave recruits for good performance.

Example Items: (a) My Drill Instructors gave credit where it was due.
(b) My Drill Instructors recognized achievement.

Coercive Power: The extent to which Drill Instructors attempted to influence recruits by punishing poor performance.

Example Items: (a) My Drill Instructors got even when things went wrong.
(b) My Drill Instructors are overly critical.

Legitimate Power: The extent to which recruits felt they were bound by formal organizational rules to follow the orders of their Drill Instructors no matter what.

Example Items: (a) Recruits are obligated to accept all their Drill Instructors orders.
(b) Drill Instructors have a right to tell recruits what to do.

Table A-2

OPERATIONAL DEFINITIONS FOR LEADERSHIP AND GROUP COHESION SCALES

(continued)

Group Teamwork: The extent to which recruits cooperated with one another and worked as a team to get necessary tasks done.

Example Items: (a) In our platoon people cooperated to get things done.
(b) Recruits stressed teamwork and team goals.

Group Support: The extent to which recruits in the platoon tried to make one another feel better when things were going bad and/or provided actual assistance on tasks that did not necessarily require teamwork.

Example Items: (a) Recruits in the platoon trust one another.
(b) Recruits in the platoon lent each other a hand when things got rough.

Table A-3

OPERATIONAL DEFINITIONS FOR ATTITUDES TOWARD THE MARINE CORPS
AND PERCEIVED PERSONAL DEVELOPMENT SCALES

Attitudes toward the Marine Corps

Affiliation: The extent to which the recruit identifies himself more with the Marine Corps than with the civilian population.

Example Items: (a) I feel that my outlook is really more that of a civilian than a Marine. (Reverse scored)
(b) If my Commanding Officer offered me an honorable discharge right now, I would not take it.

Authority: The extent to which the recruit possesses traditional views of authority including acceptance of the necessity for and importance of accepting authority in the Marine Corps.

Example Items: (a) The discipline you get in the Marine Corps is good for you.
(b) A Marine should not be allowed to talk back to his superiors.

Commitment: The extent to which the recruit feels that it is important to him personally to achieve and maintain a high level of performance in the Marine Corps.

Example Items: (a) It is important to me personally to have a good record in the Marine Corps.
(b) I don't care how well I do in the Marine Corps. (Reverse scored)

Satisfaction: The extent to which the recruit holds a positive overall evaluation of the Marine Corps and perceives it as better than other alternative occupations.

Example Items: (a) All in all, I am very satisfied with being a Marine.
(b) If I had my choice between joining the Navy, Army, Air Force, or Marines, I would still prefer to join the Marines.

Perceived Personal Development

Self-Esteem: The extent to which the recruit reports that basic training has improved him physically and mentally.

Example Items: (a) I have more self-discipline than when I started training.
(b) After going through boot camp, I believe I can do anything I set my mind to.

Social Skills: The extent to which the recruit feels that basic training has increased his ability to get along with and work with other types of people.

Example Items: (a) As a result of training I've learned to get along with other people much better.
(b) In boot camp I've learned the importance of working together to get things done.

Appendix B

BT STRESS-BT OUTCOME MODIFIER ANALYSES:

Analysis Procedures and Results

Modifier analyses were performed to determine whether recruit characteristics or the quality of interpersonal relationships in BT influenced the relationship between BT stresses and BT outcomes. The analysis procedures, results, and conclusions are described below.

Group Classifications for the Modifier Analyses

The modifier analyses compared the stress-outcome correlations found in different groups of recruits. A separate analysis was carried out for each of the 9 recruit classifications defined below.

Race: Race was determined by responses to a question on the Background Questionnaire. Groups were: Whites, Blacks, and Hispanics. Other race groups could not be investigated because there were too few group members for reliable estimation of relationships between BT stresses and BT outcomes.

Age: This information was determined from an item on the Background Questionnaire. Age groups were: 17 or 18, 19, and 20+. The oldest recruit in Study 1 was 30 years of age; the oldest recruit in Study 2 was 27 years of age.

Education: Classification was based on recruits' answers to a question on the Background Questionnaire. Groups were: Less than a high school diploma, high school diploma or Graduate Equivalency Degree (GED), high school Diploma or GED plus additional education.

General Classification Test (GCT). This test is a measure of general intelligence given to all recruits upon entry into the Marine Corps. Groups were based on the converted score for the test with the following cutoff points: Low (score = 98 or less), Medium (score = 99 to 111), High (score = 112 or more).

Home Town Size: Classification was based on recruits' answers to a question on the Background Questionnaire. Groups were: Hometown population less than 20,000, Hometown population between 20,000 and 100,000, Hometown population greater than 100,000.

Extent of Prior Delinquent Behavior: Classification was based on the response to three questions on the Background Questionnaire. The questions dealt with graduation from high school and frequency of suspensions or expulsions from school, and arrests by the police. High school graduation was scored 0 (GED or no high school diploma) or 1 (graduation with diploma). The other two items could range from 0 (never) to 4 (4 or more times). Scale scores were the sum of these three items. The scale was constructed of these items based on prior work by LaRocco, Ryman, and Biersner (6). This scale was available only in the second study. Groups were: Low (score = 0), Medium (score = 1 or 2), High (score = 3-9).

Extent of Prior Pro-social Behavior: A social participation scale was constructed to reflect positive social activities. The scale combined six items from the Background Questionnaire. Three items reflected frequency of participation in regularly scheduled school activities, in formal school athletics, and in nonschool athletics. Each item could range from 0 (none) to 4 (4 or more). Three other items reflected the number of chores at home after school (response range of 0 (none) to 4 (many chores)); holding a job prior to entering the Marine Corps (response range of 0 (no) to 3 (yes, full time job); and high school grades (response range of 1 (among the worst) to 5 (among the best)). Scale scores were the sum of these six items. This scale was based on prior work by LaRocco, Ryman, and Biersner (6). This scale was available only for the second study. Groups were: Low (score = 5-12), Medium (score = 13-15), High (score = 16-24).

Leader Support. This scale was a composite of leader support, leader structuring, and role ambiguity. This combination of leadership measures was chosen because the scales were (a) available in both studies, (b) conceptually capable of moderating stress-strain relationships (15,16), and (c) highly intercorrelated. Adding role ambiguity enhanced the precision of measurement by including an effect of structuring. Scores for the composite were the sum of the standardized scores for the individual measures.

Two additional methodological points were important for the leadership analysis. First, a composite was used to provide one overall measure rather than carrying out separate analyses for a large number of individual leadership scales. This procedure was adopted to minimize the number of analyses performed. A smaller number of analyses reduced the possibility of finding some apparently significant moderator effects due to chance. Had significant effects been found, more detailed analyses to examine the influence of individual leadership variables would have been carried out.

The second methodological point is that classification was not based on the perceptions of the individual recruit. Instead, the average score for his platoon determined whether the recruit was classified as having been in a high, medium, or low leadership platoon. The average score represents the consensus of a number of judges rather than the potentially idiosyncratic perceptions of one person. The intent in this procedure was to measure, as nearly as possible, an objective characteristic of the platoon environment.

Different subgroup cutpoints were used in the two studies. For Study 1, the groups were: Low (score = -0.22 or less), Medium (score between -0.21 and 1.07, inclusive), High (score = 1.08 or more). For Study 2, groups were: Low (score = -1.16 or less), Medium (score between -1.15 and 1.60, inclusive), High (score = 1.61 or more).

Group Cohesion. This scale was a composite of group support and group teamwork. The rationale and scoring procedures were those described for leader support. In Study 1, groups were: Low (score = -1.34 or less), Medium (scores between -1.33 and 0.89, inclusive), High (score = 0.90 or more). In Study 2, groups were: Low (scores = -1.06 or less), Medium (scores between -1.05 and 0.66, inclusive), High (score = 0.67 or more).

Analysis Procedures

(a) Recruits were divided into groups as described above.

(b) Correlations were computed for each level defined by the grouping variables. For example, correlations were computed separately for Whites, Blacks, and Hispanics.

(c) The correlations in the different subgroups were tested to see if they were significantly different (17, p. 532). A result was significant if the difference was significant at the 5% level, two-tailed, in the first study and replicated using a 5% level, one-tailed, in the second study.

Analysis Example: The general analysis procedure is illustrated by reviewing how race affected the relationship between role ambiguity and satisfaction with the Marine Corps:

(a) Recruits were classified as "White," "Black," or "Hispanic." (No other race category had sufficient numbers to permit analysis.)

(b) The relationship between role ambiguity and satisfaction was computed for each race group with the following results:

<u>Group</u>	<u>Correlation for:</u>	
	<u>Study 1</u>	<u>Study 2</u>
Whites	.38	.19
Blacks	.35	.38
Hispanics	-.09	.31

(c) The statistical significance of the differences between the correlations was computed. In Study 1, the Hispanic-White difference of $r = -.09$ versus $r = .38$ was significant ($p < .01$) and the Hispanic-Black difference was marginally significant ($r = -.09$ vs. $r = .35$, $p < .10$). In Study 2, only the Black-White difference was even marginally significant ($r = .38$ vs. $r = .19$, $p < .10$).

(d) Although differences did occur, none of the three between-group comparisons was significant in both studies. Therefore, we concluded that the variations in the correlations were due to chance factors and that race did not modify the association between role ambiguity and satisfaction.

Similar computations were carried out to determine race group differences for all other combinations of a BT stress with a BT outcome. As in the above example, the correlations were not generally identical in all three groups, but there were few significant, replicable group differences. Therefore, we concluded that race did not modify the associations between BT stresses and BT outcomes in any way.

Results. Only four significant modifier effects were found (Table B-1). This fact can be put in perspective by considering the following:

(a) Nine stresses and 12 outcomes (4 attitudes and 8 performance measures) were measured in both studies. Therefore, there were 8 associations where replicable modifier effects could occur.

(b) Each of the 9 ways of classifying recruits involved 3 groups. Thus, 3 group comparisons were possible for each correlation in each analysis (e.g., high vs. low, high vs. medium, medium vs. low). Seven of the recruit classification variables were included in both studies, so a total of 21 between group comparisons was made for each correlation.

(c) The total number of group comparisons actually computed was therefore 2268 (108 correlations x 21 comparisons for each). Even with the requirement that results replicate across studies, 4 significant findings could reasonably occur by chance.

Table B-1
Significant Stress-Outcome Modifier Effects

Modifier Variable	Predictor Variable	Dependent Variable	Study	Group ^a		
				High	Medium	Low
Education	Punishment Behavior	Affiliation	1	.046	.052	-.370 ^b
			2	-.047	-.087	-.340
Education	Role Conflict	Phase I	1	-.093	.178	-.243 ^c
		Phys. Fitness	2	-.026	-.030	-.368
GCT	Overload	Conduct Rating	1	-.091	-.306	.170 ^d
			2	-.317	-.309	.050
Group Cohesion	Punishment Behavior	Phase I Prac-	1	-.043	.212	.293 ^e
		tical Exam	2	-.048	.042	.229

^aSee Appendix B for definition of groups and details of significance tests. All significance indications below are two-tailed.

^bHigh and low groups have significantly different correlations (Study 1, $z = -2.06$, $p < .05$; Study 2, $z = -1.76$, $p < .10$).

^cHigh and medium groups have significantly different correlations (Study 1, $z = -1.77$, $p < .10$; Study 2, $z = -2.05$, $p < .05$).

^dHigh and medium groups have significantly different correlations (Study 1, $z = -2.61$, $p < .01$; Study 2, $z = -2.07$, $p < .05$).

^eHigh and low groups have significantly different correlations (Study 1, $z = -2.66$, $p < .01$; Study 2, $z = -2.06$, $p < .05$).

Some BT stress-BT outcome modifier effects could only be investigated in a single study. This was the case if the stress, the outcome, or the modifier was only measured in one of the two studies. Modifier analyses were carried out in these instances, but significant group differences occurred with less than chance frequency. Based on the results obtained in those instances where replication across the two studies was possible, it was extremely unlikely that very many of the significant differences would replicate.

Conclusion.

The results showed no satisfactory basis for inferring that substantial modifier effects were present in these studies. Even if the four replicable group differences are accepted as nonchance findings, four rather minor differences do not imply a need for substantial qualification of our general conclusions regarding BT stress-BT outcome relationships. At this time, it is reasonable to conclude that recruit characteristics, leadership, and group support do not modify the effects of BT stresses.

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM								
1. REPORT NUMBER 82-28	2. GOVT ACCESSION NO. DA-A121 982	3. RECIPIENT'S CATALOG NUMBER								
4. TITLE (and Subtitle) The Marine Corps Basic Training Experience: Stresses, Leadership, and Group Cohesion as Pre- dictors of Attitudes, Health and Performance		5. TYPE OF REPORT & PERIOD COVERED Interim								
		6. PERFORMING ORG. REPORT NUMBER								
7. AUTHOR(s) Ross R. Vickers, Jr., Marie T. Wallick, Linda K. Hervig		8. CONTRACT OR GRANT NUMBER(s)								
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Health Research Center P.O. Box 85122 San Diego, CA 92138		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS M0096-PN.001-1035								
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Medical Research and Development Command Bethesda, MD 20814		12. REPORT DATE November 1982								
		13. NUMBER OF PAGES 44								
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Bureau of Medicine and Surgery Department of the Navy Washington, DC 20372		15. SECURITY CLASS. (of this report) Unclassified								
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE								
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.										
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)										
18. SUPPLEMENTARY NOTES										
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) <table border="0"><tr><td>Attitudes</td><td>Performance</td></tr><tr><td>Basic Training</td><td>Recruits</td></tr><tr><td>Health</td><td>Stress</td></tr><tr><td>Leadership</td><td></td></tr></table>			Attitudes	Performance	Basic Training	Recruits	Health	Stress	Leadership	
Attitudes	Performance									
Basic Training	Recruits									
Health	Stress									
Leadership										
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) <p>Retrospective questionnaire assessments of Marine Corps Basic training (BT) stresses, leadership style, and group cohesion were related to BT outcomes in two samples of recruits. Stresses were classified as positive or negative based on recruit interviews carried out as part of an earlier study. Outcomes included attitudes toward the Marine Corps, feelings of personal development during BT, performance in BT, health during BT, and Fleet Marine Force (FMF) attrition. Major findings were: (a) Recruits endorsed statements describing</p>										

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102 LF 014 6601

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE/When Data Entered

20. Abstract (continued)

Positive stresses (e.g., rules emphasis, high performance goals, effort requirements) more strongly than they did statements describing negative stresses (e.g., punishment, loss of freedom, unfair treatment). (b) Positive stresses were associated with better attitudes toward the Marine Corps and feelings of self-improvement. (c) Except for unfair treatment, negative stresses had little effect on attitudes. (d) Stresses did not affect performance, health, or FMF attrition. (e) Leadership style was an important predictor of attitudes toward the Marine Corps. (f) The typical BT graduate achieved performance and fitness levels well above minimum Marine Corps requirements. Overall, BT produces positive outcomes for graduates. Stress evaluations must be based on attitudinal outcomes because stress was not related to performance, health, or FMF attrition. Positive stresses were therefore shown to have positive effects. Unfair treatment was the most questionable BT stress. The limited impact of negative stresses may be due to the context of high positive stress levels and good leadership.

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE/When Data Entered

END

DATE
FILMED

9 — 83

DTIC